

PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

| | | |
|---|-----------|---|
| (51) International Patent Classification ⁶ : G06K 19/06, G06F 7/10 | A1 | (11) International Publication Number: WO 99/41700 (43) International Publication Date: 19 August 1999 (19.08.99) |
| (21) International Application Number: PCT/IB99/00268 (22) International Filing Date: 15 February 1999 (15.02.99) (30) Priority Data: 1819601/AM 13 February 1998 (13.02.98) GB (71) Applicant: TATIS LIMITED [GB/GB]; Harston Mill, Harston, Cambridge CB2 5NH (GB). (71)(72) Applicant and Inventor: DURAND, Julian [IT/CA]; 31 Lockhart, Saint Pierre de Wakefield, Quebec J8N 2R9 (CA). (72) Inventor: VEYRASSAT, Marc-Henri; Grand Rue, 50, CH-1180 Rolle (CH). (74) Common Representative: TATIS LIMITED; 18 bis, Avenue Juste-Olivier, CH-1006 Lausanne (CH). | | (81) Designated States: European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> |
| (54) Title: TRADE INFORMATION SYSTEM (57) Abstract Trade Information System (TIS) is a trade data management system whose central objective is to streamline and automate the customs clearance and reconciliation procedures of customs and fiscal authorities in developing and emerging countries. TIS(tm) has been designed to replace a service known as preshipment inspection currently used in over thirty countries throughout the developing world. TIS is a networked process that allows governments, customs and tax authorities, and other participants in the global trade arena to easily access, exchange, and reconcile vital trade-related information. TIS enables information such as the names of the trade players, the quantity, description and value of goods, and other critical information to be captured at the export stage, validated, and disseminated simultaneously in two different directions: electronically to government officials in the country of import and as a secure machine-readable document (2D bar code) that travels with the shipment. Information is not only transmitted to the Fiscal Authorities in the country of import by the network. In addition, the trade related information is digitally signed and encoded on a 2 dimensional symbol (PDF417) that can be read by a scanner. When the shipment arrives at the port of entry, the customs officer need only scan the bar code with a portable scanner to gain instant access to the validated information required for customs clearance. | | |

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

BNSDOCID: <WO_9941700A1_1_>

Trade Information System

Description

Trade Information Systems (TIS) is a system that allows participants such as exporters, importers, shipping agents, banks and governments to share information more securely and easily. TIS integrates both electronic information from networks with a machine-readable stamp (the 'TISymbol') that carries the pertinent information from shipping documents (see section 2.3.5).

The TISymbol is a unique integration of a PDF417 2D bar code (so that paper documentation is machine readable) together with a digital signature (to ensure that authenticity of issuer may be identified and to guarantee that information has not been modified).

In the sections that follow, we describe the applications and environment in which the TISymbol will be used; the TISymbol is used as a digitally signed and certified authorization for the exporter to ship its goods and is described in section 2.2; finally the data elements that are present in each of the databases is described and, more specifically, the data that makes up the TISymbol.

Applications

There are five applications (for the Importer, VA, VB, Point of Entry, Fiscal Authorities and the Exporter) that will be used in the prototype. The attached Drawings document shows this in Figure 1.

In addition to these five applications which manage the on-going TIS process, there is a registration procedure for importers where details of the corporation are submitted to the VA for approval and issuing of public/private key pair. In this process, the importer identifies their principal business partners (the 'exporters') abroad that will be registered as well. In the prototype we will not provide certification of these key pairs since it can be assumed that issuance of the key pair by the VA will serve as a de facto certification. In the production version, we will almost surely use certified keys.

All applications share core functions of testing (communications, signing with digital signature); login to the application using private key; tracking of transactions through the TIS system.

TIS/Importer RTA (Request Transit Authorization)

The importer application requests authorization for a transaction by submitting transaction details on-line to the VA. The process is as follows:

- 1) login with profile;
- 2) transmit transaction details (see Appendix 1 the Transaction Record);

The VA receives RTA and considers results from RAS. If further intervention is required the VA sends instruction to VB.

- 3) if authorization is issued by the VA, the importer is notified and is then able to track status of shipment;

TIS/VA (TIServer)

The validation authority makes use of the TIServer and the RAS to authorize transactions, issue an instruction to a Validation Body and issue a TISymbol. The authorization control flow with relevant states is depicted in the section below.

Procedure as follows:

- 1) login with profile;
- 2) receive RTA from importer;
- 3) perform risk analysis on participants and transaction;
- 4) issue instruction to VB as required;
- 5) authorize (or not) transaction and issue TISymbol;
- 6) transmit transaction record to FA.

TIS/Exporter

The exporter application is straightforward providing the capability to:

- 1) receive an encrypted TISymbol;
- 2) decrypt the TISymbol;
- 3) print the TISymbol;
- 4) track the consignment.

TIS/FA Fiscal Authorities (FA application)

The TIS/FA is the application used by the client government. With the TIS/FA users will have the following capabilities:

- 1) receive new transaction records;
- 2) authorize a transaction;
- 3) set risk indicators and their relative weight in the RAS;

- 4) perform risk analysis on incoming transactions;
- 5) send schedule of incoming transactions to the POEs with inspection instructions;
- 6) reconcile transaction record when goods have been received at the POE and set status of transaction record to 'closed';
- 7) send status of all transaction records to TIS/VA with inspection results.

TIS/ POE Point of Entry

The customs officers use the point of entry application. It allows the POE to:

- 1) Receive pending shipments list from TIS/FA with instructions;
- 2) read and verify the TISymbol;
- 3) perform reconciliation of the transaction record with the TIS/FA;
- 4) in case there was an inspection the results should be recorded and later transmitted to TIS/FA.

Authorization Flow Chart

The authorization chart is depicted in Figure 2 in the attached drawings document. In order for a TIS transaction to be approved and the TISymbol issued, it is necessary for the Importer to send a Request for Transaction Authorization. The RTA is the trigger for the process. Note that in some cases it will be possible for the exporter to also trigger the process by sending an RTA.

The RTA is sent to the Validation Authority. Experts at the VA will be presented with incoming RTA and the result of the Risk Analysis System recommending action of some sort. If the RAS indicates error levels are acceptable, then the status of the transaction becomes 'OK' and the TISymbol is sent to the Exporter. The Exporter shall have the opportunity to refuse the transaction if there are errors.

Should the RAS indicate abnormalities in the transaction information then the VA sends an instruction to the relevant Validation Body. The status of the transaction becomes VB_WAIT.

Should the report of the VB indicate that the transaction is all right, the status is set back to OK and the TISymbol issued. Otherwise, if the VB reports that there are continuing irregularities, then the matter is presented to the Fiscal Authorities who have the last word.

If the FA refuses the shipment then the procedure is complete and the transaction cancelled. The status is set to NO. Otherwise the status is set to OK and the TISymbol is issued.

These details can be seen in the figure and table below.

| Status | Meaning |
|----------|---|
| OK | Authorization given (either by VA immediately or as a result of VB report or FA intervention). TISymbol is issued. |
| WAIT_VB | The RAS indicates an unacceptable level of risk. The VA instructs the VB to investigate further. Status is waiting for VB report. |
| WAIT_FA | The VB report indicates there is too high risk or some other irregularity. The RTA is forwarded to the FA for final decision. |
| NO | The FA refuses RTA. |
| C(LOSED) | The goods arrive at the port of entry and the transaction record is closed. |

Data Elements

The simplified entity-relationship diagram is depicted in Figure 3 in the attached drawings document.

Transaction Record

There are two tables that are used for each transaction. These are called TRANSACTION which hold the details for a particular transaction and TRANSACTION_PM which holds details of the packages and their marks.

The TRANSACTION table is detailed in the figure below with its data elements and type.

| | Field Name | Description | Risk? |
|----------------|----------------|---|-------|
| Transaction_ID | Transaction_ID | Unique id to identify each transaction | No |
| POE | POE | Planned port-of-entry linked to Port of Entry lookup table | Yes |
| ExporterID | ExporterID | Exporter, linked to the EXPORTER table | Yes |
| ImporterID | ImporterID | Importer, linked to the IMPORTER table | Yes |
| Qtypkges | Qtypkges | Number of Packages | No |
| Regdate | Regdate | Date of registration of transaction request | Yes |
| Shipdate | Shipdate | Planned ship date | Yes |
| ETA | ETA | Expected Date of Arrival | Yes |
| LOC_ID | LOC_ID | Letter of Credit ID | No |
| LOC_Expiry | LOC_Expiry | Letter of Credit Expiry | Yes |
| Status | Status | Status of transaction (details in flow control section below) | No |
| Mark | Mark | Descriptive packaging marks for entire consignment | No |
| Mode | Mode | Mode of transportation | Yes |
| POOCity | POOCity | Port of Origin City | Yes |
| POOCountry | POOCountry | Port of Origin Country | Yes |
| Vessel | Vessel | Identification of vessel (name, license no etc) | Yes |
| SA_ID | SA_ID | Shipping agent ID | Yes |
| ContainerNo | ContainerNo | Container number | No |
| SealNo | SealNo | Seal number | No |
| InvoiceNo | InvoiceNo | Invoice Number | No |
| InvoiceDate | InvoiceDate | Invoice Date | Yes |
| OrderNo | OrderNo | Order No | No |
| PO_No | PO_No | Purchase Order number | No |
| TotalInvoice | TotalInvoice | Total Amount of Invoice | Yes |
| InvoiceCurr | InvoiceCurr | Invoice Currency | Yes |
| Results | Results | Result from POE | No |

Transaction details for each package

| TRANSACTION_PM | Field Name | Description | Risk? |
|---|----------------|--|-------|
| TPM_ID LONG (AK) transaction_ID LONG (FK) (IE) PM_ID LONG (FK) (IE) HSC_ID LONG (FK) (IE) COG TEXT(2) ProdNo LONG ProdName TEXT(50) Qty LONG UnitPrice LONG | TPM_ID | ID number for each package in shipment | No |
| | transaction_ID | ID of transaction this P&M belongs to | No |
| | PM_ID | Packaging & Marks code | No |
| | HSC_ID | HS code | Yes |
| | COG | Country of Origin of goods | Yes |
| | ProdNo | Product Number | Yes |
| | ProdName | Product Name | Yes |
| | Qty | Quantity | Yes |
| | UnitPrice | Unit Price | Yes |

Importer Table

| IMPORTER | Field Name | Description | Risk? |
|---|-------------|--------------------|-------|
| IMPORTER_ID LONG Name TEXT(30) (IE) Address TEXT(50) (IE) City TEXT(30) (IE) ZIP TEXT(10) Country TEXT(2) (IE) Contact TEXT(50) (IE) Phone TEXT(20) Fax TEXT(20) Email TEXT(30) (IE) Pkey OBJECT PrivKey OBJECT Regdate DATE (IE) License TEXT(20) LicenseExpiry DATE | IMPORTER_ID | Unique ID | No |
| | Name | Company name | Yes |
| | Address | Address | No |
| | City | City | Yes |
| | ZIP | Zip or postal code | No |
| | Country | Country | Yes |
| | Contact | Contact person | Yes |
| | Phone | Telephone number | No |
| | Fax | Fax number | No |
| | Email | Email address | No |
| | Pkey | Public key | No |
| | PrivKey | Private key | No |

| | | | |
|--|---------------|-------------------------------|-----|
| | Regdate | Registration date | Yes |
| | License | Import license number | Yes |
| | LicenseExpiry | Expiry date of import license | Yes |

Exporter Table

| EXPORTER | Field Name | Description | Risk? |
|--|-------------|--------------------|-------|
| EXPORTER_ID LONG Name TEXT(30) (IE) Address TEXT(50) (IE) City TEXT(30) (IE) ZIP TEXT(10) Country TEXT(2) (IE) Contact TEXT(30) (IE) Phone TEXT(20) Fax TEXT(20) Email TEXT(30) (IE) Pkey OBJECT Privkey OBJECT Regdate DATE (IE) | EXPORTER_ID | Unique ID | No |
| | Name | Company name | Yes |
| | Address | Address | No |
| | City | City | Yes |
| | ZIP | Zip or postal code | Yes |
| | Country | Country | Yes |
| | Contact | Contact person | Yes |
| | Phone | Telephone number | No |
| | Fax | Fax number | No |
| | Email | Email address | No |
| | Pkey | Public key | No |
| | Privkey | Private key | No |
| | Regdate | Registration date | Yes |

TISymbol

| Table Name | Field ¹ |
|-------------|--------------------|
| TRANSACTION | transaction_ID, |
| IMPORTER | IMPORTER_ID |
| IMPORTER | Name |
| IMPORTER | Address |
| IMPORTER | City |
| IMPORTER | ZIP |
| IMPORTER | Country (lookup) |
| IMPORTER | License |

¹ see previous table descriptions for meaning of field names

| | |
|--------------|-------------------------|
| IMPORTER | LicenseExpiry |
| TRANSACTION | LOC_ID |
| TRANSACTION | LOC_Expiry |
| TRANSACTION | InvoiceNo |
| TRANSACTION | InvoiceDate |
| TRANSACTION | TotalInvoice |
| _CURRENCY | CurrencySymbol (lookup) |
| TRANSACTION | ContainerNo |
| TRANSACTION | SealNo |
| TRANSACTION | P_number |
| FirstPackage | ProdNo |
| FirstPackage | ProdName |
| FirstPackage | _PM.Name (lookup) |
| FirstPackage | HSC_ID |
| FirstPackage | _HSC.Name (lookup) |
| LastPackage | ProdNo |
| LastPackage | ProdName |
| LastPackage | PMName |
| LastPackage | HSC_ID |
| LastPackage | HSCName |
| EXPORTER | EXPORTER_ID |
| EXPORTER | Name |
| EXPORTER | Address |
| EXPORTER | City |
| EXPORTER | ZIP |
| EXPORTER | Country (lookup) |
| _POE | POE_ID |

| | |
|-------------|---------------------|
| _POE | POE_Name |
| _POE | Country (lookup) |
| TRANSACTION | Shipdate |
| TRANSACTION | ETA |
| TRANSACTION | PM_ID |
| TRANSACTION | POOCity |
| TRANSACTION | POOCountry (lookup) |
| TRANSACTION | Vessel |
| TRANSACTION | SA_ID |
| _SA | SA_Name |
| TRANSACTION | OrderNo |
| TRANSACTION | PO_No |

Claim

(1) The TISymbol is an integration of a 2 dimensional bar code (PDF417) with information secured with a certified digital signature. Prior art includes the 2D symbol (PDF417) and the means of digitally signing information. What does not, to date, exist is the integration of these technologies as it applies to international trade. There are a number of important issues that are involved with this integration the greatest constraints being data capacity and verification of the certified digital signature with a hand held device. The creation of the TISymbol successfully addresses these issues.

(2) The TISymbol Scanner is capable of reading the compressed TISymbol and verifying the certified digital signature.

Symbol technologies currently builds and sells scanners that can read 2D symbols (PDF417), however, the scanner cannot verify the certified digital signature without connecting to a computer for processing. TIS requires that the verification of a digital signature be carried out on a handset, therefore, we have designed a scanner that will have an on-board verification chip that will provide speedy hardware verification of the digital signature. The verification chip is available from ASCOM for the IDEA encryption / digital signature algorithm. We will be the first to incorporate both reading of data with the verification of the digital signature.

1/3

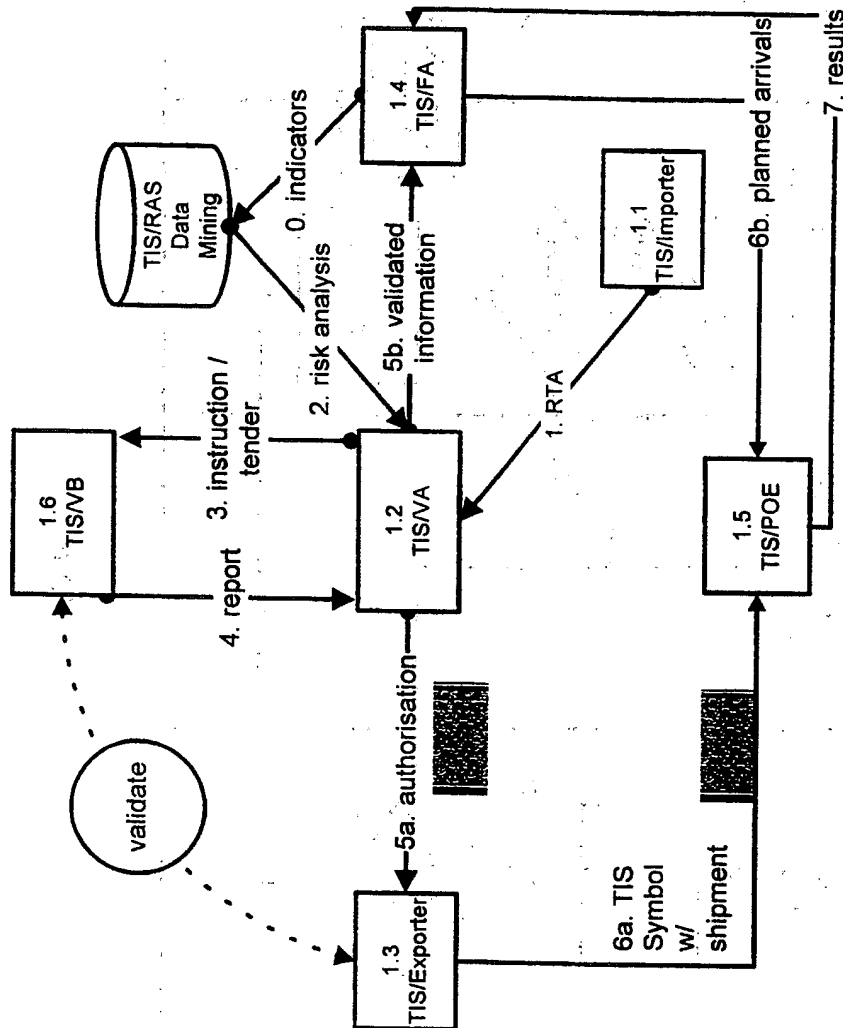


Figure 1

2/3

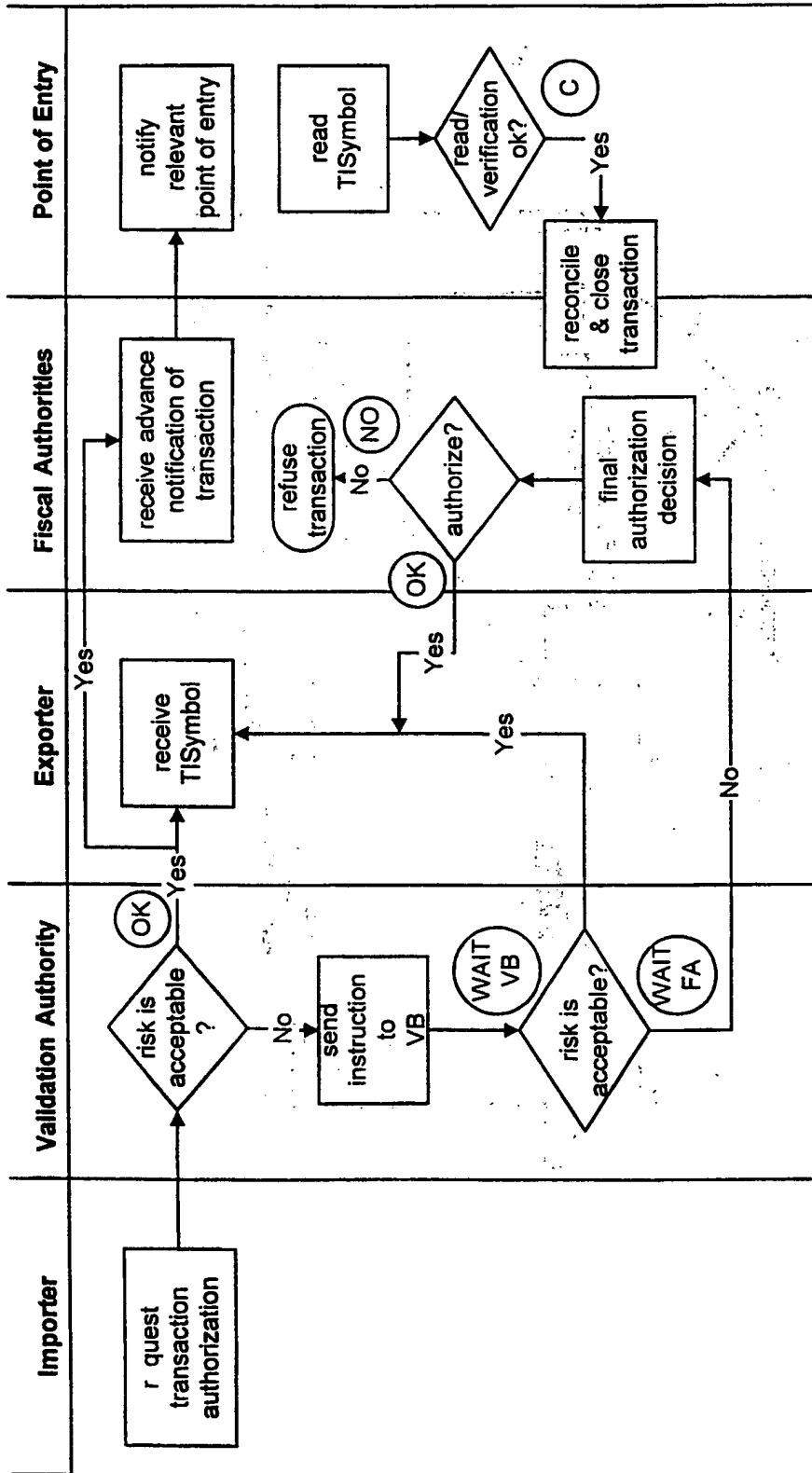


Figure 2

3/3

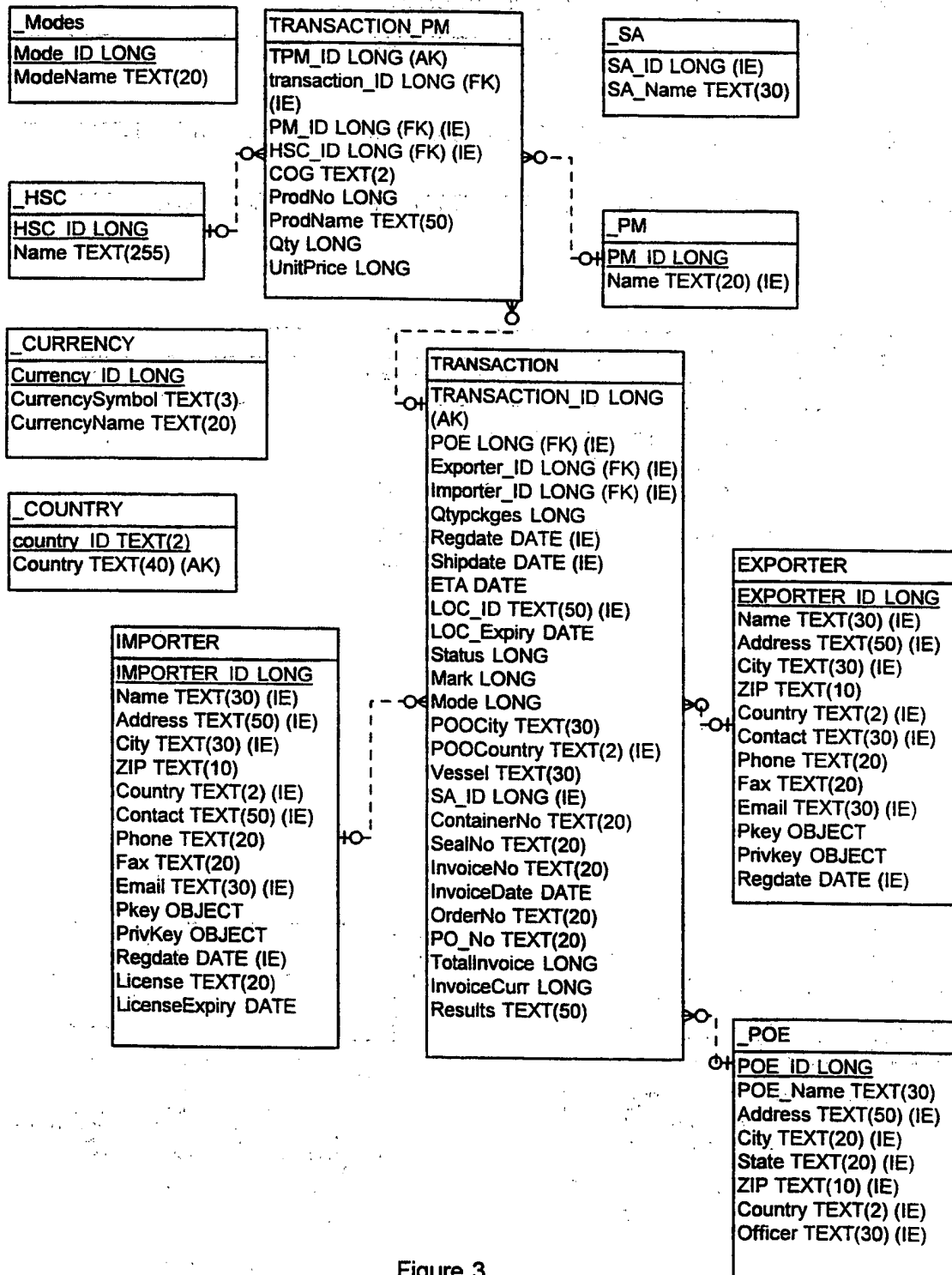


Figure 3

INTERNATIONAL SEARCH REPORT

Int. Application No.

PCT/IB 99/00268

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 G06K19/06 G06F7/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 G06K G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| A | US 5 598 477 A (BERSON WILLIAM) 28 January 1997 see column 3, line 52 - column 4, line 9 | 1,2 |
| A | EP 0 600 646 A (PITNEY BOWES) 8 June 1994 see column 3, line 19 - column 5, line 24; figure 2 | 1,2 |

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

2 July 1999

Date of mailing of the international search report

21.07.1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Chiarizia, S

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB 99/00268

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 1 partly and 2 partly
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
The wording of the two independent claims is such that it does not allow to perform a search that could be considered as being complete. An incomplete search has been performed on a combination of a 2 dimensional bar code with secured information, like digital signature.
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.